

KRŠKO NUCLEAR POWER PLANT

Nuklearna Elektrarna Krško	
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TECHNICAL SPECIFICATION FOR
Decommissioning and treatment of old steam generators

Non-Nuclear Safety Related

Specification Number
SP-ES1420


KRŠKO NUCLEAR POWER PLANT
Revision 1
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TABLE OF CONTENTS

1	BACKGROUND	3
1.1	Site Location	3
1.2	Treatment of SGs	3
2	SCOPE OF SERVICES	3
3	SAFETY CLASSIFICATION OF WORK	4
4	DESIGN INPUT	4
5	APPLICABLE DESIGN CONTROL PROGRAM	4
6	APPLICABLE CODES, STANDARDS, AND DESIGN CRITERIA FOR THE WORK	4
7	AFFECTED SYSTEM	4
8	IDENTIFICATION OF AFFECTED EQUIPMENT	4
9	REVIEW AND/OR VERIFICATION OF THE WORK	4
10	SCHEDULE REQUIREMENTS	5
11	STATUS REPORTING REQUIREMENTS	5
12	WORK TO BE PERFORMED OR INFORMATION TO BE PROVIDED BY NEK	5
13	CHANGES OF WORK SCOPE	5
14	DELIVERABLES TO BE PROVIDED BY THE CONTRACTOR	5
15	RECORDS	6
16	ORGANIZATIONAL CONTACT	6
17	CONTRACTOR TECHNICAL APPROACH TO THE WORK	6
18	ACCESS TO CONTRACTOR FACILITY AND DOCUMENTS	7
19	SUBCONTRACTED WORK	7
20	QUALITY ASSURANCE REQUIREMENTS	7
21	NEK PROPRIETARY DATA	7
22	ATTACHMENTS	8
22.1	ATTACHMENT 1: Old SG General Arrangement Drawing	8
22.2	ATTACHMENT 2: Old SG General schematic representation	9
22.3	ATTACHMENT 3: Layout of the old SGs within the (Decontamination Building)	10

1 BACKGROUND

In 2000, Krško NPP performed Steam Generator (SG) replacement and stored two originally installed Steam Generators in an onsite dedicated Decontamination Building (DB). The SGs, which are stored horizontally in a Room DB01, are 20.6 m long with the widest diameter of 4.5 m. Taking these dimensions into account, they occupy a total volume of 622 m³. The total mass of both evaporators is 646 000 kg. The service provider shall prepare a feasibility study on the decommissioning of the two old SGs. The report shall analyze the transport, cutting and melting. Additionally a possibility of initial on-site cutting of the SGs at the NEK location, transport requirements and requirements and restrictions for the treatment/decommissioning shall be set up by the service provider. SGs have therefore been in storage for 20 years and short lived radionuclides have decayed.

After the study is performed, the service provider shall transport and decommission the SGs and transportation of the residual radioactive waste back to Krško NPP.

1.1 Site Location

The Nuclear Power Plant Krško is located on the northern bank of the Sava River approximately 2 km southeast of the town of KRŠKO in the east-southeast part of the Republic of Slovenia. The site is on the northwestern brim of an alluvial valley surrounded by hills varying in relative elevation from 200 m to 700 m. The ground surface elevation of the site is 155.20 m above sea level.

Access to the site is provided from the local road Krško to Brežice passing north of the site. An access railroad about 2.000 meters long is constructed from Krško station to the site and connected to the Ljubljana - Zidani Most - Zagreb railroad network. The Sava River is not navigable in the vicinity of the site. There are seven hydropower plants located upstream and one downstream the NEK.

The site has good transport connections: international railway line Ljubljana - Zagreb (1.08 km from the site), international road E94 (3 km from the site). A major 380 kV electric power distribution network passes through the location.

1.2 Treatment of SGs

The SGs must be treated in such a way where minimal waste for final disposal is kept. The returned material shall be packaged and delivered on site in the NEK designated packing.

2 SCOPE OF SERVICES

Contractor's work within the scope of this specification consists of the following tasks:

- Phase 1: Development of a Technical approach/Study for the relocation of the old Steam Generators from the Decontamination Building. The possibility of moving SGs in one piece or cutting them into two pieces shall be evaluated. Transport mode and route shall be checked and verified and costs estimated. Transport and SG treatment timeline shall be developed. Study shall include technical description of the SG treatment/decommissioning process, radiological sampling of the inside of the SG if applicable, and a description of the final treatment with an assessment of the generation of secondary radioactive and non-radioactive waste.
- Phase 2: Onsite activities as per result of the feasibility study (phase1), and transport of both SGs from Krško NPP to the decommissioning/treatment site.
- Phase 3: Decommissioning and treatment of both SGs and Radiological characterization of secondary radioactive waste.
- Phase 4: Transportation of the secondary radioactive waste back to Krško NPP using the specified NPP Krško acceptable packaging.

Cost of each Phase shall be estimated within the bid proposal.

3 SAFETY CLASSIFICATION OF WORK

This work is classified as Non-Nuclear Safety.

4 DESIGN INPUT

A Contractor shall define the list of all necessary inputs (drawings, other plant data) needed for performing the described scope of work and include it in Proposal. NEK will inform Contractor on availability of information sources. NEK will inform Contractor which of the stated sources can be delivered to Contractor and under which terms. NEK may decide that to some of the sources a Contractor will have access only at NEK site.

5 APPLICABLE DESIGN CONTROL PROGRAM

N/A

6 APPLICABLE CODES, STANDARDS, AND DESIGN CRITERIA FOR THE WORK

- 6.a NEK Updated Safety Analysis Report, Chapter 11: Radioactive Waste Management,
- 6.b Rules on radioactive waste and spent fuel management, OG RS, No. 125/2021, 30.07.2021,
- 6.c All applicable standards and EU Directives governing the transboundary transportation of radioactive materials.

7 AFFECTED SYSTEM

N/A.

8 IDENTIFICATION OF AFFECTED EQUIPMENT

N/A.

9 REVIEW AND/OR VERIFICATION OF THE WORK

The Contractor is required to perform detailed work verification by internal review process.

The external review process will be performed by NEK.

The review process shall be in-depth review of documents, analyses and other products to assure analyses accuracy, adequacy, applicability and credibility from the engineering perspective.

10 SCHEDULE REQUIREMENTS

This time includes the following milestones:

Task	Time	Title of Activity
10.0	T0	Contract award
10.1	T0+6 months	Delivery of the Phase 1 Study
10.2	Year 2024	Transport of SGs to the treatment site
10.3	Year 2027	Decommissioning and treatment of both SGs
10.4	Year 2027	Return of secondary radioactive waste to Krško NPP

11 STATUS REPORTING REQUIREMENTS

- 11.a The Contractor shall provide written status reports on a monthly basis to NEK.
- 11.b The monthly reports are expected to contain the following information:
- Overall status of work including potential technical open issues;
 - Status of the activities per Contract Schedule – identification of any delays and contingency measures prepared and implemented to come back to the original/contractual schedule. List of key plan activities for next month,
 - Any other issue that need to be communicated and resolved to perform work.

12 WORK TO BE PERFORMED OR INFORMATION TO BE PROVIDED BY NEK

- 12.1 The NEK Project Manager will provide the overall project coordination and management.
- 12.2 NEK will provide the documentation as specified in the Proposal and referred in Sections 4 and 6 of this specification.

13 CHANGES OF WORK SCOPE

Not applicable.

14 DELIVERABLES TO BE PROVIDED BY THE CONTRACTOR

- 14.a The Contractor will be required to develop the Phase 1 Study according to the schedule outlined in Section 10. Each of these deliverables shall be written in accordance with the requirements from section 14.g.
- 14.b NEK will provide comments/approval for the preliminary Phase 1 Study/Report not later than within specified period for review.
- 14.c Contractor shall resolve all potential open items from NEK comments and issue the Final Phase 1 Study.
- 14.d All reports shall be reviewed and approved by NEK

Deliverables:	Copies
Delivery of Preliminary Study	soft file
Delivery of Final Study	3HC+3 SC
Presentation of the Final Study results (one working day meetings in Slovenia with detailed presentation)	

HC= Hard Copy, SC= Soft Copy

14.e Other types of documents to be provided by the Contractor include:

- a. Monthly status reports (Section 11) from project start until final versions of all deliverables are provided to NEK.

14.f Deliverables should be sent to NEK Project Manager according to the schedule in the form as defined in 14.d.

14.g Technical documents shall respect the following requirements.

Word Processor: Microsoft Word, Excel (for figures and tabulated data)

Paper: A4 (A3 for schemes where needed)

Pictures: All the pictures must be delivered electronically in appropriate, clearly readable resolution and file format.

14.h All the documentation shall be written in English language.

15 RECORDS

Not applicable.

16 ORGANIZATIONAL CONTACT

16.a Contractor shall co-ordinate all technical and schedule matters with the assigned NEK project manager. NEK project manager will coordinate involvement and work with the Croatian Fund for financing the decommissioning of NEK (FUND) and Slovenian Agency for the radioactive waste (ARAO). All correspondence shall go through NEK project manager.

16.b At NEK following are technical contacts:

NEK project manager: Matjaž Gričar

Phone: + 386 7 4802 330

E-mail: matjaz.gricar@nek.si

17 CONTRACTOR TECHNICAL APPROACH TO THE WORK

The Contractor shall prepare a proposal with brief Technical Approach Plan which will outline how the work is going to be performed. It should also contain Contractor's interpretation of scope of work, as described by this specification. It should include definition of milestones as described in Section 10.

18 ACCESS TO CONTRACTOR FACILITY AND DOCUMENTS

The contractor will provide access to NEK to all documents created within this project, references and other relevant information, which are essential during the development, internal review and final delivery of this project. The contractor will provide support for contacting Harbor Operator/Authorities to investigate SG on-loading options.

19 SUBCONTRACTED WORK

The Contractor shall not subcontract any portion of the Work without the written approval of the NEK. Subcontractors will be required to be technically qualified to satisfy all NEK criteria.

20 QUALITY ASSURANCE REQUIREMENTS

The Contractor's Project QA Plan is to be submitted to NEK as part of the Proposal.

21 NEK PROPRIETARY DATA

NEK has a proprietary interest in all of the drawings, design specifications, reference documents, information or know-how that may be furnished pursuant contract execution. NEK has a proprietary interest in any know-how, improvement, discovery or invention which may be made, developed, or conceived in the performance of work hereunder or which may arise or result there from (hereinafter collectively referred to as the "Information"). All such information shall be considered to be proprietary to the NEK. The right to use of all such Information shall be transmitted to the Contractor only for its personnel use and shall be entirely restricted to the performance of the Contract and subject to the confidentiality provision.

None of the documents shall be marked as proprietary of contractor, since all documents and reports shall be available for Slovenian and Croatian governmental institutions.

22 ATTACHMENTS

22.1 ATTACHMENT 1: Old SG General Arrangement Drawing

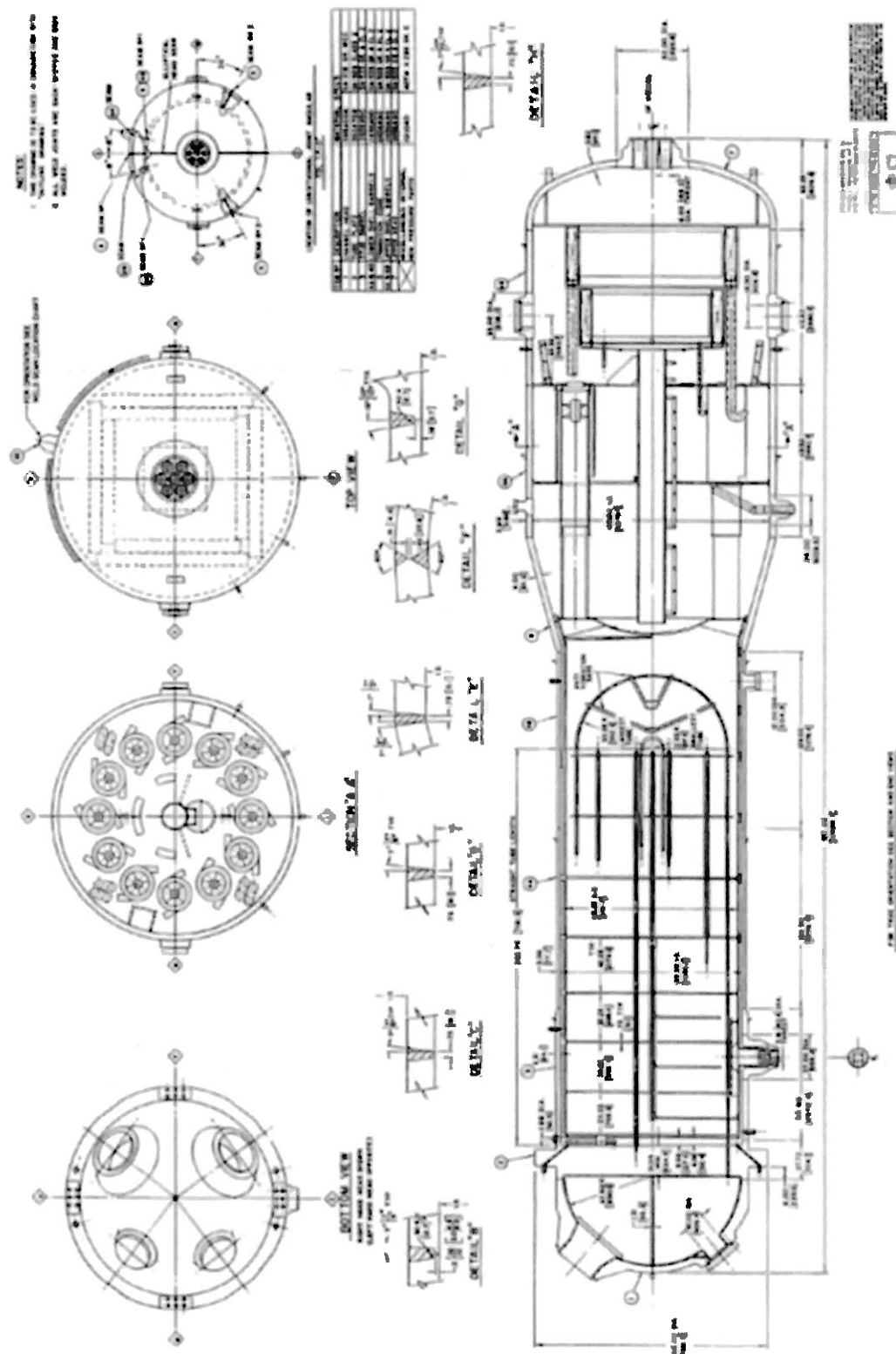
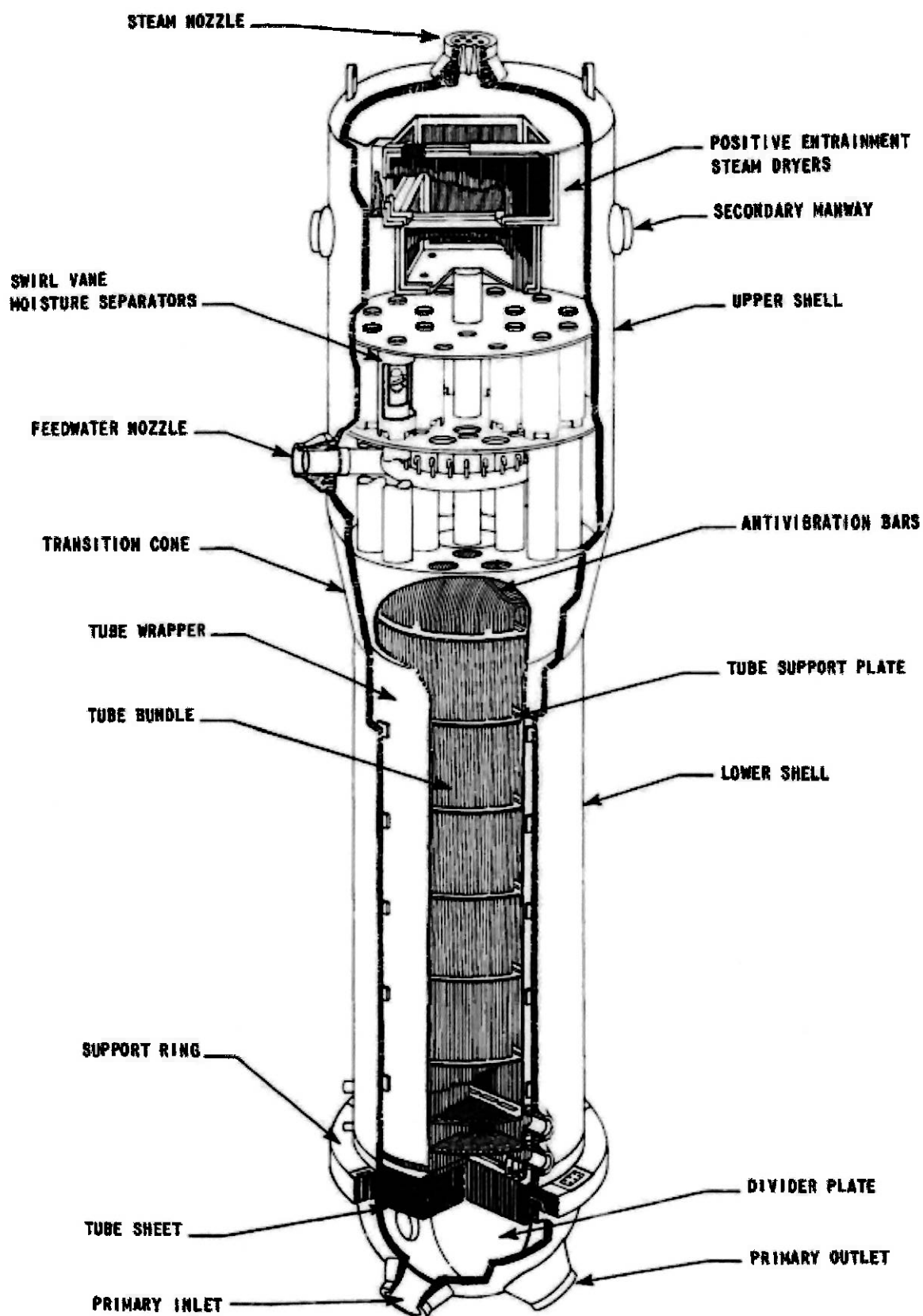


FIGURE 1-2 = Ground Assignment

22.2 ATTACHMENT 2: Old SG General schematic representation



22.3 ATTACHMENT 3: Layout of the old SGs within the (Decontamination Building)